**Summer 2012. Earth History Assessment**

1. Which of the following rates is most useful to estimate the age of Earth?

(A) The rate that sediment accumulates.

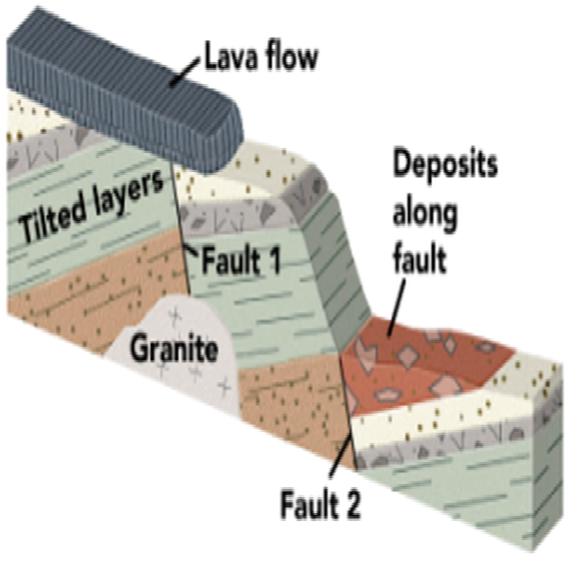
(B) The rate that radioactive atoms decay.

(C) The rate that salts accumulate in the ocean.

(D) The rate that the planet loses heat.

(E) None of the above

2. Which of the following features is younger than fault 1? **Choose all that apply.**

(A) Lava flow  
(B) Granite  
(C) Tilted layers  
(D) Deposits along fault  
(E) None of the above

3. All rocks in the following diagram are sedimentary, except for R and Q which are igneous. V is a fault. What are the relative ages of units Q, R, S, T, U, V in order from oldest to youngest? (> means older than, so that the oldest is on the left in all choices)



(A) U>S>T>Q>R>V

(B) T>S>U>R>V>Q

(C) U>S>T>R>Q>V

(D) U>S>T>R>V>Q

(E) U>S>T>V>R>Q

4. Where is the oldest layer in this tilted sequence of sedimentary rocks?

(A) At the top of the hill in the center of the photograph  
(B) The darkest layers will be the oldest  
(C)The layers on the lower left part of the photograph  
(D) The layers on the right of the photograph

5. Some scientists claim that they can determine when the Earth first formed as a planet. Which technique(s) do scientists use today to determine when the Earth first formed? **Choose all that apply.**

(A) Comparison of fossils found in rocks

# (B) Comparison of layers found in rocks

# (C) Analysis of uranium found in rocks

(D) Analysis of carbon found in rocks

(E) Scientists cannot calculate the age of the Earth

6. A scientist collects all of the fossils ever discovered into one room. This room now contains:

(A) Fossils of a few of the plants and animals that ever lived

(B) Fossils of most of the plants and animals that ever lived

(C) Fossils of most of the types of plants and animals that ever lived

(D) Fossils of all of the plants and animals that ever lived

(E) Fossils of all of the types of plants and animals that ever lived

7. Fossils are studied by scientists interested in learning about the past. Which of the following can become fossils? **Choose all that apply.**

(A) Bones

# (B) Plant material

(C) Marks left by plants

(D) Marks left by animals

(E) Animal material

8. Which of the following characteristics of fossil organisms make them good biostratigraphic markers for correlating geographically separated rock layers?

(A) Species that were widespread and existed for a brief period of time.

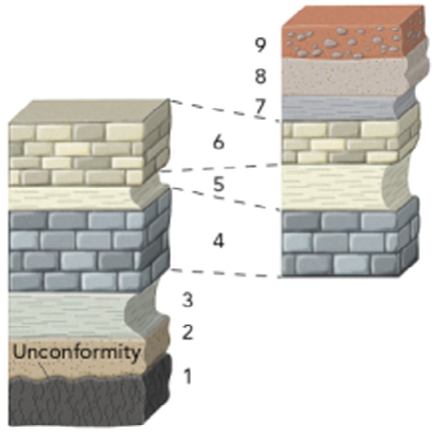
(B) Species that occurred only locally and existed for a long period of time

(C) Species that were widespread and existed for a long period of time

(D) Species that occurred only locally and existed for a brief period of time

(E) None of the combinations above

9. This figure shows two sections that partially overlap in age. Dashed lines show how the two sections correlate. What can you conclude from these correlations?

  
   
a. The oldest unit is unit 4  
b. The youngest unit is unit 6  
c. The rate at which unit 5 was deposited was constant across the area  
d. The left section includes older rocks than the right section  
e. None of the above

10. Which technique for determining when the Earth first formed as a planet is most accurate?

(A) Comparison of fossils found in rocks

# (B) Comparison of layers found in rocks

# (C) Analysis of uranium found in rocks

(D) Analysis of carbon found in rocks

(E) Scientists cannot calculate the age of the Earth

11. Some people say that radioactivity is a process that sometimes occurs on Earth. Which of the following statements about radioactivity do you think are true? Choose all that apply.

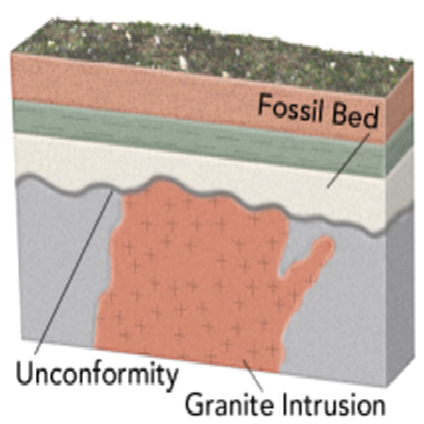
(A) Radioactivity only occurs if carbon is present in an object

(B) Radioactivity can occur in the atmosphere, but not at the Earth’s surface

(C) Radioactivity only occurs when created by people

# (D) Half-life is a measure of how quickly radioactivity decreases

(E) Half-life and radioactivity decrease and eventually disappear

12. What would fossil ages from the geologic timescale and an isotopic age on the granite tell us about the age of the unconformity?   
   
(A) The unconformity is older than the isotopic age of the granite  
(B) The unconformity is older than the age assigned to the fossils  
(C) The granite is younger than the unconformity  
(D) It is not possible to have fossils preserved so close to a granite  
(E) None of the above

13. A hypothetical radioactive isotope has a half-life of 15,000 years. If there are 75 grams of radioactive parent and 25 grams of stable daughter product in a mineral, how old is the mineral containing the radioactive material? (assume no daughter was present at the time of formation of the rock)

(A) 15,000 years

(B) 7,500 years

(C) 20,000 years

(D) 3,750 years

14. If you could travel back in time to when the Earth first formed as a planet, what type(s) of life do you think you might encounter?

(A) There would be no life on Earth

(B) Simple, one-celled organisms

(C) Animal and plant life in water, but none on land

(D) All types of life in water and on land, except people

(E) All types of life in water and on land, including people

15. Which answer best describes what the surface of the Earth would be like if you could travel back to the time when the Earth first formed as a planet?

(A) The Earth’s surface was covered with jungles

(B) The Earth ‘s surface was covered with water

# (C) The Earth’s surface was covered with undeveloped land

# (D) The Earth’s surface was covered with melted rock

(E) The Earth’s surface was covered with ice

16**.** Which of the following statements do you think best describes the relationship between people and dinosaurs?

# (A) People and dinosaurs co-existed for about five thousand years

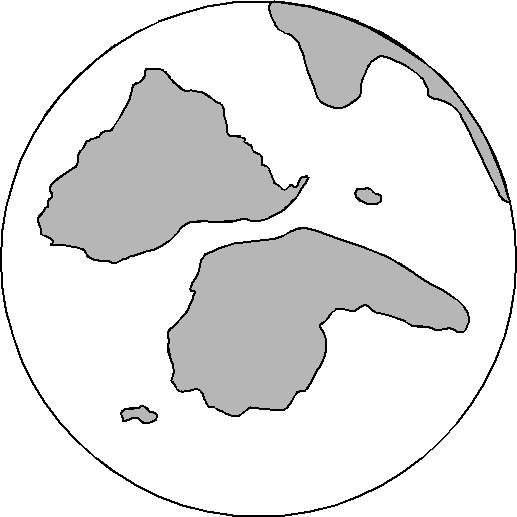
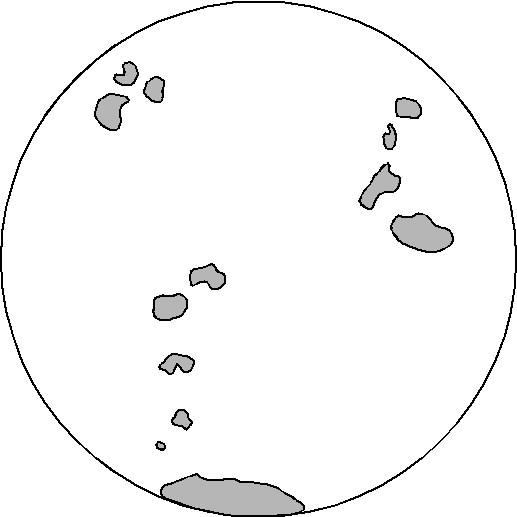
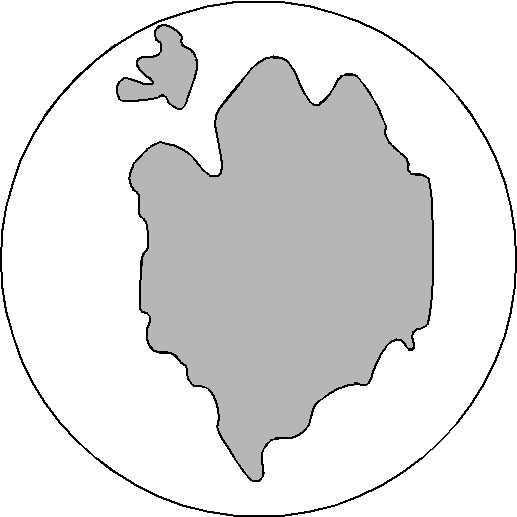
(B) People and dinosaurs co-existed for about five hundred thousand years

# (C) Dinosaurs died out about five thousand years before people appeared on Earth

(D) Dinosaurs died out about five hundred thousand years before people appeared on Earth

(E) Dinosaurs died out about fifty million years before people appeared on Earth

17. The figure below is a view of one-half of the Earth’s surface as seen from space today. The gray areas represent land, and the white represents water. Which of the other figures do you think most closely represents this half of the Earth’s surface when humans first appeared on Earth?



D

C

A

B

18. Scientists have discovered fossils of four-legged creatures called dinosaurs. How much time passed between the appearance and extinction of these creatures?

(A) Hundreds of years

(B) Thousands of years

### (C) Millions of years

(D) Billions of years

(E) Some of these creatures still exist

19. If you could travel back in time to when the Earth first formed as a planet, how many years back in time would you have to travel?

(A) 4 hundred years

(B) 4 hundred-thousand years

(C) 4 million years

# (D) 4 billion years

# (E) 4 trillion years

20. Which of the figures below do you think most closely represents changes in life on Earth over time? D

